International Tungsten Industry Association

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FedEx

Dr. Scott A. Masten
Office of Chemical Nomination and Selection
NIEHS/NTP
P.O. Box 12233, MD A3-07
Research Triangle Park, NC 27709

Dear Dr. Masten:

The International Tungsten Industry Association (ITIA) Committee on Safety, Health and Environment has read with interest the notice of nomination of tungsten trioxide and fibrous tungsten suboxides for testing by the NTP. We respectfully submit the following comments on the Summary of Data for Chemical Selection for Tungsten Trioxide and Suboxides.

The Basis of Nomination to the NTP states that tungsten oxide whiskers result from the calcination of tungsten oxide, ammonium paratungstate (APT) and blue oxide. However, in the manufacturing process, tungsten oxides are not calcined, but are the result of calcination of ammonium paratungstate. The oxides produced by calcination of APT are then reduced to tungsten metal powder.

Under several sections in the document it is claimed that blue oxide $W_{20}O_{58}$ ($WO_{2.90}$) is fibrous. This is however not completely true. Pure blue oxide is a non-fibrous material. The next phase, $W_{18}O_{49}$ ($WO_{2.72}$) does however consists mainly of irregular shaped agglomerations of whiskers or fibers. This phase is normally present in commercially available blue oxide.

Under the section on Human Exposure, it is stated "Tungsten oxide fibers were first detected in the environment of a Swedish hard-metal industry." It is important to note that tungsten oxide exposure only occurs between the calcination of APT to tungsten oxides and reduction of the oxides to tungsten metal. Tungsten powder used in the hard metals industry is then carburized to form tungsten carbide. Sahle et al. (Sahle 1996) concluded that airborne tungsten oxide fibers were not observed at carburizing localities. The starting materials in hard metals production are tungsten carbide and various alloying ingredients, such as cobalt (Meyer-Bisch et al 1989, Auchincloss et al. 1992, McDermott 1971, Miller et al 1953, Kusaka at al. 1986). These materials are blended, pressed, sintered and ground to the desired shape. Tungsten oxides are not typically present in hard metals production operations. It should be mentioned that the "hard metal workers" exposed to tungsten oxide fibres in the two Swedish hard metal factories studied in the Sahle 1996 study only worked in the calcination / reduction area and not in hard-metal production. The hard-metal production, defined as above, were located in separate buildings, 200 metres and several kilometres respectively away from the calcination/reduction buildings.

It has been suggested that tungsten oxide fibers may contribute to the development of pulmonary fibrosis in hard metals workers (Sahle, 1992). We believe this to be an erroneous conclusion. It

is highly unlikely that tungsten oxide fibers play a role in the development of pulmonary fibrosis in the hard metals workers given the facts that (1) tungsten oxide fibers are not typically present in hard metal production operations, (2) interstitial lung disease (hard metals disease) has been reported in workers physically removed from exposure to any operations or materials containing tungsten oxides and, (3) after over 100 years of tungsten production, there are no reliable reports of respiratory disease in workers involved in the production of tungsten powder where tungsten oxide is an intermediate. As noted in the Summary, Russian studies reporting respiratory effects in the early stages of hard metals production are limited. These studies are of questionable value as they do not describe the smoking, medical or work histories of the workers examined. No control groups were mentioned and details on the method or quality of the radiological evaluations are not provided.

We trust that these comments will be helpful to your chemical selection process. Please contact me by e-mail at carmen.venezia@sylvania.com or by phone at 570-268-5128 if you have any questions or require further information.

Sincerely,

Carmen Venezia
Chairman, ITIA Health Safety and Environmental Committee

cc: Michael Maby
Secretary General, ITIA

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